

# Danfoss TMT 500 151Z3064 orbital hydraulic motor

Manufacturer: Danfoss

Manufacturer part number / published order designation: 151Z3064

Published model: 151Z3064

## About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

## Execution notes and conditions

Full model code not published by the factory; exact article verified in the original ordering table.

Technical fields transcribed from original manufacturer pages; current factory card omits its attribute table.

Representative factory photograph; use the exact execution drawings.

Separate catalogue limits; check the actual operating point and drain/shaft-load conditions.

## Source-page index

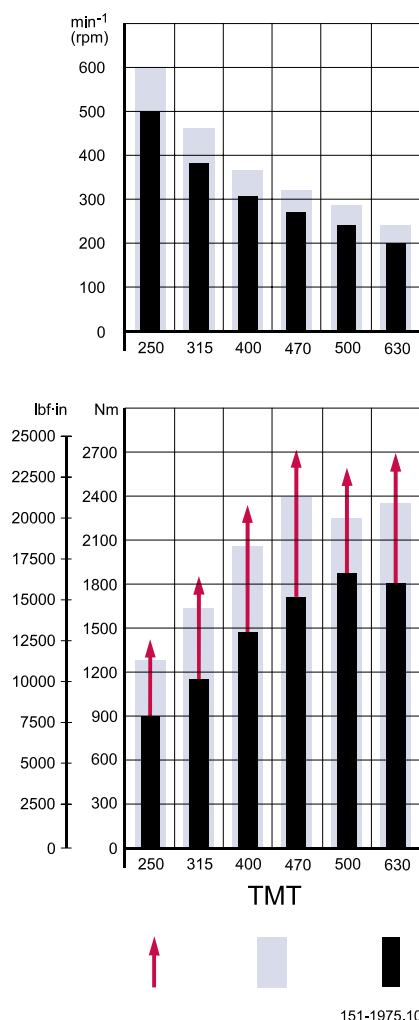
Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

### Source A: Danfoss TMT technical information - March 2016

| Original pages | Compiled pages | Relevant content                                                                       |
|----------------|----------------|----------------------------------------------------------------------------------------|
| 6-7            | 2-3            | Exact ordering-table column, hydraulic data, performance, shaft or US mounting drawing |
| 9-14           | 4-9            | Exact ordering-table column, hydraulic data, performance, shaft or US mounting drawing |
| 19             | 10             | Exact ordering-table column, hydraulic data, performance, shaft or US mounting drawing |
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| 31-32          | 13-14          | Exact ordering-table column, hydraulic data, performance, shaft or US mounting drawing |

## Data survey

### Speed and torque



Peak values, Intermittend values, Continuous values

The bar diagrams above are useful for a quick selection of relevant motor size for the application. The final motor size can be determined by using the function diagram for each motor size.

- TMT can be found in [Function diagrams](#) on page 17

The function diagrams are based on actual tests on a representative number of motors from our production. The diagrams apply to a return pressure between 5 and 10 bar [75 and 150 psi] when using mineral based hydraulic oil with a viscosity of 35 mm<sup>2</sup>/s [165 SUS] and a temperature of 50°C [120°F]. For further explanation concerning how to read and use the function diagrams, please consult the paragraph "Selection of motor size" in the *Technical Information General - 520L0232*.

## Versions

### Versions and code numbers

#### TMT versions

| Mounting flange           | 4-Bolt    |           |                |                |                |                |            |            |                |
|---------------------------|-----------|-----------|----------------|----------------|----------------|----------------|------------|------------|----------------|
| Spigot diameter           | Ø 160 mm  | Ø 125 mm  | Ø 5 in         | Ø 160 mm       | Ø 125 mm       | Ø 5 in         | Ø 160 mm   | Ø 125 mm   | Ø 5 in         |
| Bolt circle diameter (BC) | Ø 200 mm  | Ø 160 mm  | Ø 6.37 in      | Ø 200 mm       | Ø 160 mm       | Ø 6.37 in      | Ø 200 mm   | Ø 160 mm   | Ø 6.37 in      |
| Shaft                     | Cyl 40 mm | Cyl 40 mm | Cyl 1.5 in     | Splined 1.5 in | Splined 1.5 in | Splined 1.5 in | Tap. 45 mm | Tap. 45 mm | Tap. 1 3/4 in  |
| Port size                 | G 3/4     | G 3/4     | 1 1/16 - 12 UN | G 3/4          | G 3/4          | 1 1/16 - 12 UN | G 3/4      | G 3/4      | 1 1/16 - 12 UN |
| European version          | ●         | ●         |                | ●              | ●              |                | ●          | ●          |                |
| US version                |           |           | ●              |                |                | ●              |            |            | ●              |
| Side port version         | ●         | ●         | ●              | ●              | ●              | ●              | ●          | ●          | ●              |
| Standard shaft seal       | ●         | ●         | ●              | ●              | ●              | ●              | ●          | ●          | ●              |
| Drain connection          | Yes       | Yes       | Yes            | Yes            | Yes            | Yes            | Yes        | Yes        | Yes            |
| Check valve               | No        | No        | No             | No             | No             | No             | No         | No         | No             |
| Code numbers              |           |           |                |                |                |                |            |            |                |
| TMT 250                   | 151Z3010  | 151Z3016  | 151Z3060       | 151Z3020       | 151Z3026       | 151Z3070       | 151Z3030   | 151Z3036   | 151Z3080       |
| TMT 315                   | 151Z3011  | 151Z3017  | 151Z3061       | 151Z3021       | 151Z3027       | 151Z3071       | 151Z3031   | 151Z3037   | 151Z3081       |
| TMT 400                   | 151Z3012  | 151Z3018  | 151Z3062       | 151Z3022       | 151Z3028       | 151Z3072       | 151Z3032   | 151Z3038   | 151Z3082       |
| TMT 470                   | 151Z3013  | -         | 151Z3063       | 151Z3023       | -              | 151Z3073       | 151Z3033   | -          | 151Z3083       |
| TMT 500                   | 151Z3014  | -         | 151Z3064       | 151Z3024       | -              | 151Z3074       | 151Z3034   | -          | 151Z3084       |
| TMT 630                   | 151Z3015  | -         | 151Z3065       | 151Z3025       | -              | 151Z3075       | 151Z3035   | -          | 151Z3085       |

#### TMT U versions

| Mounting flange           | 4-Bolt   |                |
|---------------------------|----------|----------------|
| Spigot diameter           | -        | -              |
| Bolt circle diameter (BC) | -        | -              |
| Shaft                     | -        | -              |
| Port size                 | G 3/4    | 1 1/16 - 12 UN |
| European version          | ●        |                |
| US version                |          | ●              |
| Side port version         | ●        | ●              |
| Standard shaft seal       |          |                |
| Drain connection          | Yes      | Yes            |
| Check valve               | No       | No             |
| Code numbers              |          |                |
| TMT U 250                 | 151Z3000 | 151Z3100       |
| TMT U 315                 | 151Z3001 | 151Z3101       |
| TMT U 400                 | 151Z3002 | 151Z3102       |
| TMT U 470                 | 151Z3003 | 151Z3103       |
| TMT U 500                 | 151Z3004 | 151Z3104       |
| TMT U 630                 | 151Z3005 | 151Z3105       |

## Versions

- Painted

## Code numbers

| Displacement [cm <sup>3</sup> ] |          |          |          |          |          |
|---------------------------------|----------|----------|----------|----------|----------|
| 250                             | 315      | 400      | 470      | 500      | 630      |
| 151Z3010                        | 151Z3011 | 151Z3012 | 151Z3013 | 151Z3014 | 151Z3015 |
| 151Z3016                        | 151Z3017 | 151Z3018 | -        | -        | -        |
| 151Z3060                        | 151Z3061 | 151Z3062 | 151Z3063 | 151Z3064 | 151Z3065 |
| 151Z3020                        | 151Z3021 | 151Z3022 | 151Z3023 | 151Z3024 | 151Z3025 |
| 151Z3026                        | 151Z3027 | 151Z3028 | -        | -        | -        |
| 151Z3070                        | 151Z3071 | 151Z3072 | 151Z3073 | 151Z3074 | 151Z3075 |
| 151Z3030                        | 151Z3031 | 151Z3032 | 151Z3033 | 151Z3034 | 151Z3035 |
| 151Z3036                        | 151Z3037 | 151Z3038 | -        | -        | -        |
| 151Z3080                        | 151Z3081 | 151Z3082 | 151Z3083 | 151Z3084 | 151Z3085 |
| 151Z3000                        | 151Z3001 | 151Z3002 | 151Z3003 | 151Z3004 | 151Z3005 |
| 151Z3100                        | 151Z3101 | 151Z3102 | 151Z3103 | 151Z3104 | 151Z3105 |
| 151Z3040                        | 151Z3041 | 151Z3042 | 151Z3043 | 151Z3044 | 151Z3045 |
| 151Z3050                        | 151Z3051 | 151Z3052 | 151Z3053 | 151Z3054 | 151Z3055 |
| 151Z3090                        | 151Z3091 | 151Z3092 | 151Z3093 | 151Z3094 | 151Z3095 |
| 151Z3110                        | 151Z3111 | 151Z3112 | 151Z3113 | 151Z3114 | 151Z3115 |
| 151Z3120                        | 151Z3121 | 151Z3122 | 151Z3123 | 151Z3124 | 151Z3125 |
| 151Z3130                        | 151Z3131 | 151Z3132 | 151Z3133 | 151Z3134 | 151Z3135 |
| 151Z3229                        | 151Z3230 | 151Z3231 | 151Z3232 | 151Z3233 | 151Z3234 |
| 151Z3273                        | 151Z3274 | 151Z3275 | 151Z3276 | 151Z3277 | 151Z3278 |
| 11033922                        | 11033923 | 11033924 |          | 11033926 | 11033927 |
| 15                              | 15       | 16       | 16       | 17       | 17       |

## Technical data

### Technical data for TMT, TMTU, TMTW and TMT FL

Technical data for TMT, TMTU, TMTW and TMT FL

| Type<br>Motor size                            |                                                              |                     | TMT<br>250 | TMT<br>315 | TMT<br>400 | TMT<br>470 | TMT<br>500 | TMT<br>630 |
|-----------------------------------------------|--------------------------------------------------------------|---------------------|------------|------------|------------|------------|------------|------------|
| Geometric displacement                        | cm <sup>3</sup>                                              |                     | 251.8      | 326.3      | 410.9      | 477.3      | 494.8      | 629.1      |
|                                               | [in <sup>3</sup> ]                                           |                     | [15.37]    | [19.91]    | [25.07]    | [29.13]    | [30.19]    | [38.39]    |
| Maximum speed                                 | min <sup>-1</sup>                                            | cont.               | 500        | 380        | 305        | 270        | 250        | 200        |
|                                               | [rpm]                                                        | int. <sup>(1)</sup> | 600        | 460        | 360        | 320        | 300        | 240        |
| Maximum torque                                | N·m<br>[lbf·in]                                              | cont.               | 940        | 1,230      | 1,520      | 1,760      | 1,770      | 1,830      |
|                                               |                                                              | int. <sup>(1)</sup> | 1,290      | 1,660      | 2,120      | 2,420      | 2,240      | 2,290      |
|                                               |                                                              | peak <sup>(2)</sup> | 1,440      | 1,865      | 2,355      | 2,735      | 2,390      | 2,740      |
| Maximum output                                | kW<br>[hp]                                                   | cont.               | 35         | 35         | 37         | 37         | 35         | 27         |
|                                               |                                                              | int. <sup>(1)</sup> | 47         | 47         | 51         | 49         | 42         | 33         |
| Maximum pressure drop                         | bar<br>[psi]                                                 | cont.               | 250        | 250        | 250        | 250        | 250        | 200        |
|                                               |                                                              | int. <sup>(1)</sup> | 350        | 350        | 350        | 350        | 325        | 250        |
|                                               |                                                              | peak <sup>(2)</sup> | 400        | 400        | 400        | 400        | 375        | 300        |
| Maximum oil flow                              | l/min<br>[US gal/min]                                        | cont.               | 125        | 125        | 125        | 125        | 125        | 125        |
|                                               |                                                              | int. <sup>(1)</sup> | 150        | 150        | 150        | 150        | 150        | 150        |
| Maximum starting pressure with unloaded shaft | bar<br>[psi]                                                 |                     | 6          | 6          | 6          | 6          | 6          | 6          |
| Minimum starting torque                       | at maximum pressure drop cont.<br>N·m [lbf·in]               |                     | 780        | 1,060      | 1,360      | 1,500      | 1,530      | 1,600      |
|                                               | at maximum pressure drop int. <sup>(1)</sup><br>N·m [lbf·in] |                     | 1,080      | 1,520      | 1,930      | 2,050      | 1,820      | 1,980      |

<sup>(1)</sup> Intermittent operation: the permissible values may occur for maximum 10% of every minute

<sup>(2)</sup> Peak load: the permissible value may occur for maximum 1% of every minute

| Type          |                     | Max. inlet pressure |        | Max. return pressure with drain line |        |
|---------------|---------------------|---------------------|--------|--------------------------------------|--------|
|               |                     | bar                 | [psi]  | bar                                  | [psi]  |
| TMT 250 - 630 | cont.               | 270                 | [3915] | 140                                  | [2030] |
|               | int. <sup>(1)</sup> | 370                 | [5365] | 175                                  | [2540] |
|               | peak <sup>(2)</sup> | 420                 | [6090] | 210                                  | [3045] |

For max. permissible combination of flow and pressure, see function diagram for actual motor

**Technical data**

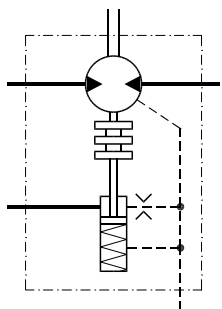
**Technical data for brake motor TMT FL and TMTW FL**

| Technical data for brake motor TMT FL and TMTW FL |     |       |          |          |
|---------------------------------------------------|-----|-------|----------|----------|
| Holding torque <sup>1)</sup>                      | N·m | 2,000 | [lbf·in] | [17,700] |
| Min. release pressure <sup>2)</sup>               | bar | 13    | [psi]    | [190]    |
| Max. release pressure cont.                       | bar | 20    | [psi]    | [365]    |
| Max. release pressure peak                        | bar | 40    | [psi]    | [580]    |

<sup>1)</sup> Brakes with higher holding torque available, please contact Danfoss.

<sup>2)</sup> The release pressure is the difference between the pressure in the brake line and the pressure in the drain line.

Bleed off from brake release chamber to drain line is 0.65 l/min [0.172 US gal/min] at 13 bar [188 psi] release pressure.

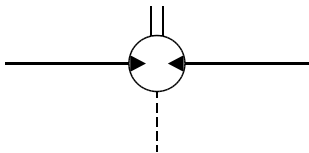


151-1931.10

**Maximal permissible shaft seal pressure**

TMT with standard shaft seal and drain connection.

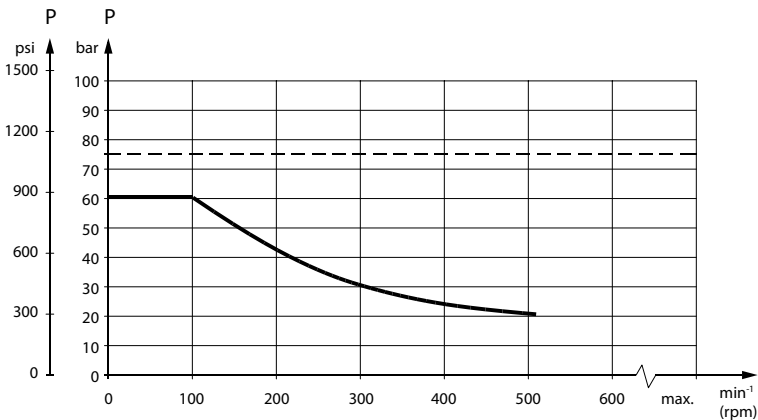
The pressure on shaft seal equals the pressure in the drain line.



151-1983.10

TMT FL and TMTW FL with standard shaft seal.

The pressure on shaft seal equals the pressure in release port.



151-1673.10

## Technical data

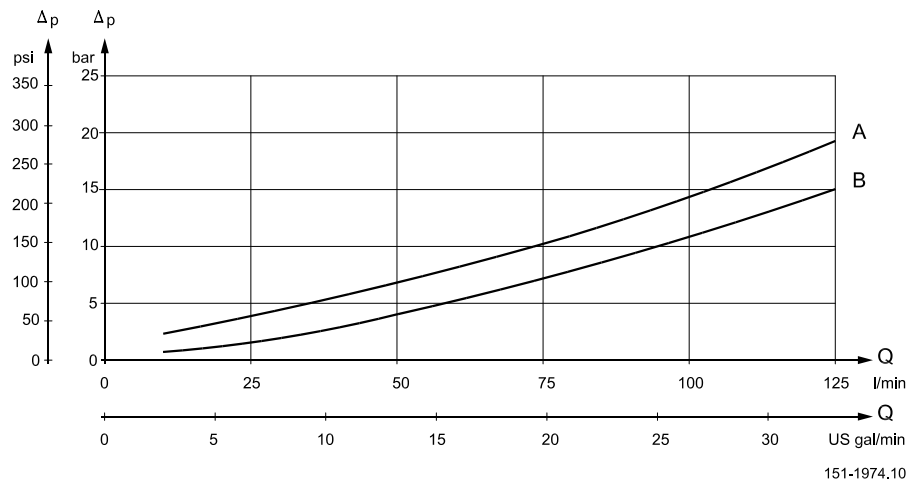
---- Intermittent operation: The permissible values may occur for max. 10% of every minute.

\_\_\_\_\_ Continuous operation

### **Warning**

Drain line should always be used.

## Pressure drop in motor



The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm<sup>2</sup>/s [165 SUS].

**A:** TMT 250, 315

**B:** TMT 400, 470, 500 and 630

## Oil flow in drain line

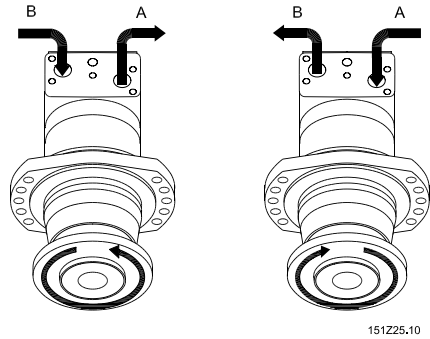
The table below shows the max. oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi].

| Pressure drop |        | Viscosity          |       | Oil flow in drain line |              |
|---------------|--------|--------------------|-------|------------------------|--------------|
| bar           | [psi]  | mm <sup>2</sup> /s | [SUS] | l/min                  | [US gal/min] |
| 200           | [2900] | 20                 | [100] | 2.5                    | [0.66]       |
|               |        | 35                 | [165] | 1.5                    | [0.40]       |
| 275           | [3990] | 20                 | [100] | 4.0                    | [1.10]       |
|               |        | 35                 | [165] | 2.5                    | [0.66]       |

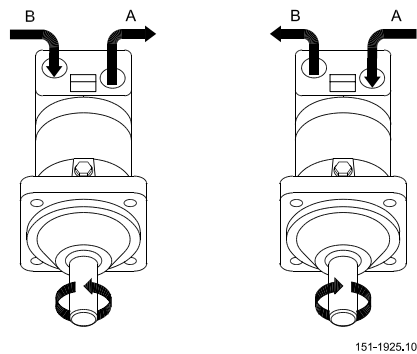
## Technical data

### Direction of shaft rotation

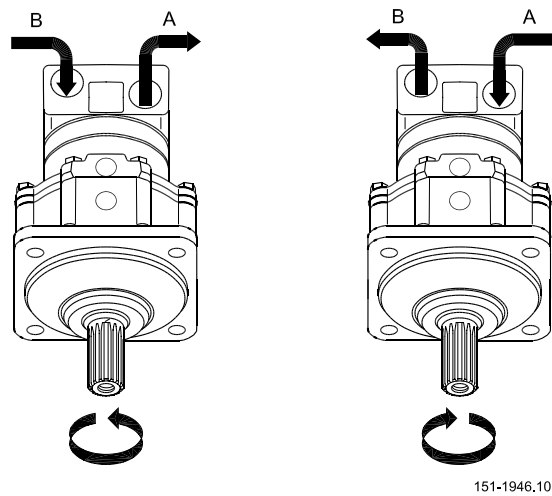
*TMTW*



*TMT*



*TMT FL*



### Permissible radial shaft load

The output shaft runs in tapered roller bearings that permit high axial and radial forces.

The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

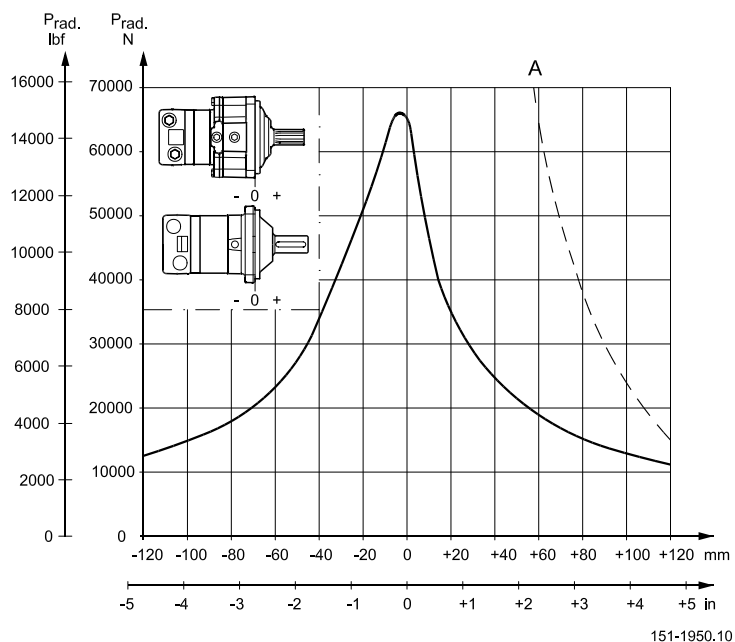
## Technical data

The curve is based on B10 Bearing life (2,000 hours or 12,000,000 shaft revolutions at  $100 \text{ min}^{-1}$ ) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

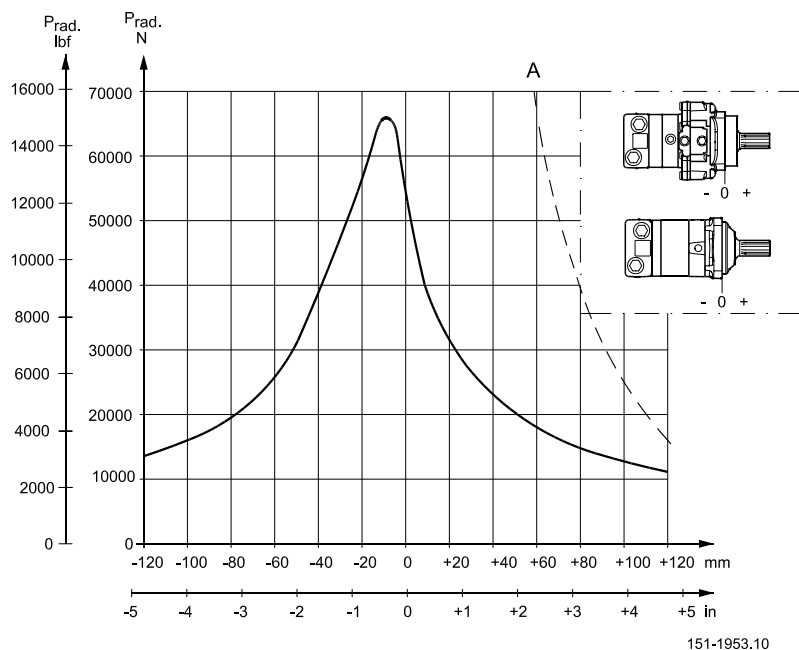
The dash curve **A** shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

### Permissible shaft load for TMT and TMT FL

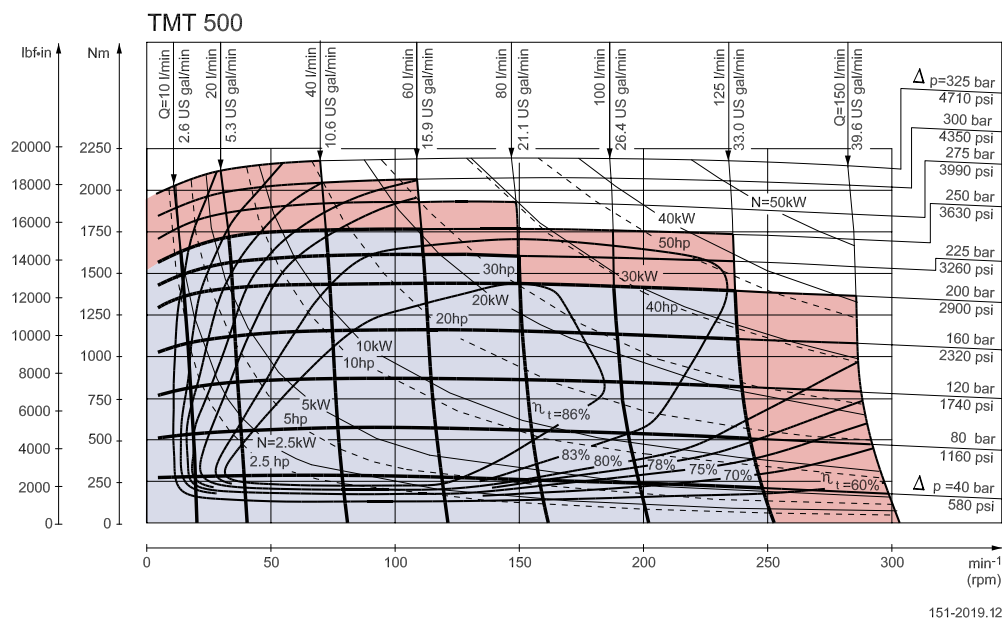
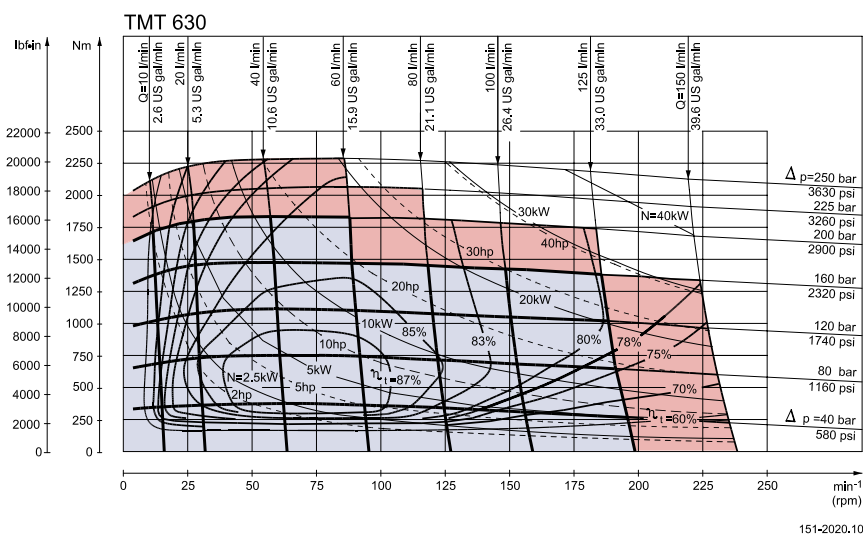
Spigot diameter  $\varnothing 160 \text{ mm}$  [6.3 in] TMT and  $\varnothing 180 \text{ mm}$  [7.1 in] TMT FL



Spigot diameter  $\varnothing 125 \text{ mm}$  [4.92 in] TMT and TMT FL



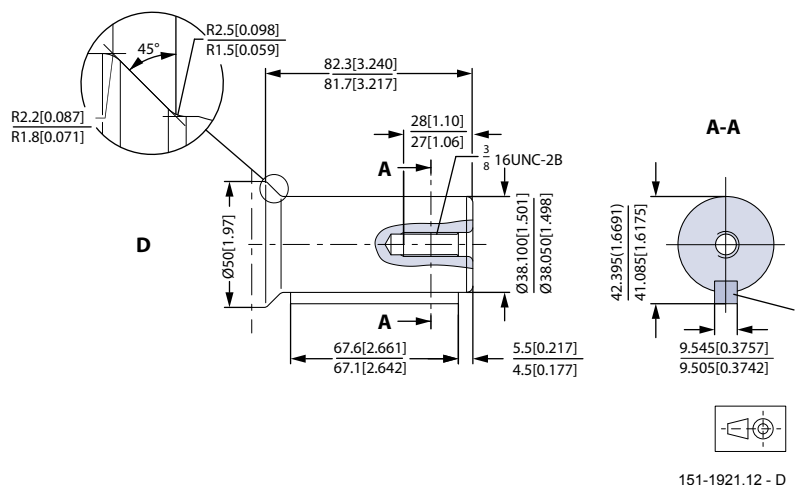
## Function diagrams



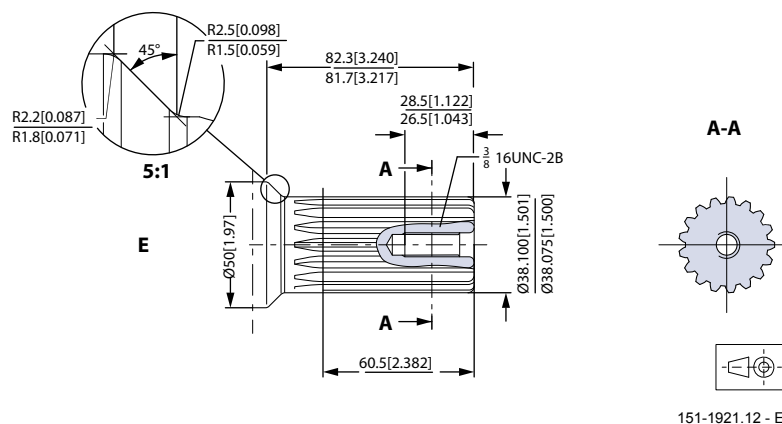
## Shaft version

- C:** Tapered shaft  $\varnothing$  45 mm, (ISO/R775)
- E:** DIN 937, Across flats: 46 mm, Tightening torque:  $500 \pm 30$  N·m [ $4425 \pm 265$  lbf·in]
- D:** Taper 1 : 10
- G:** Parallel key, B12 x 8 x 28

## TMT shaft, US versions



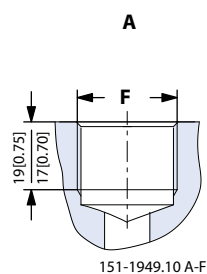
- D:** Cylindrical shaft,  $\varnothing$  1 1/2 inch
- I:** Parallel key, 3/8 x 3/8 x 2 1/4 inch, B.S. 46



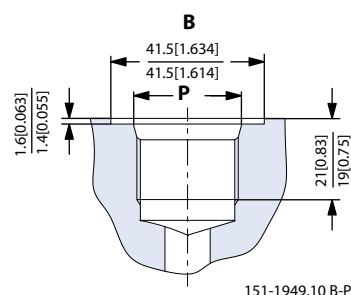
- E:** Involute splined shaft ANS B92.1 - 1970 standard, Flat root side fit, Pitch 12/24, Teeth 17, Major diameter 1.50 inch, Pressure angle 30°

## Technical data

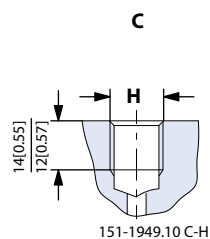
### Port thread versions



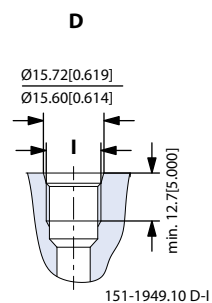
- A:** G Main port  
**F:** ISO 228/1 – G  $\frac{3}{4}$



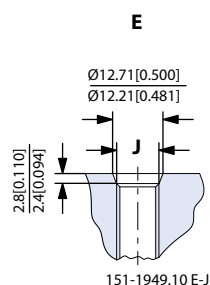
- B:** UNF Main port  
**P:** 1  $\frac{1}{16}$  – 12 UN



- C:** G Drain/release port  
**H:** ISO 228/1 – G  $\frac{1}{4}$



- D:** UNF Drain port  
**I:** 9/16 – 18 UNF O-ring boss port

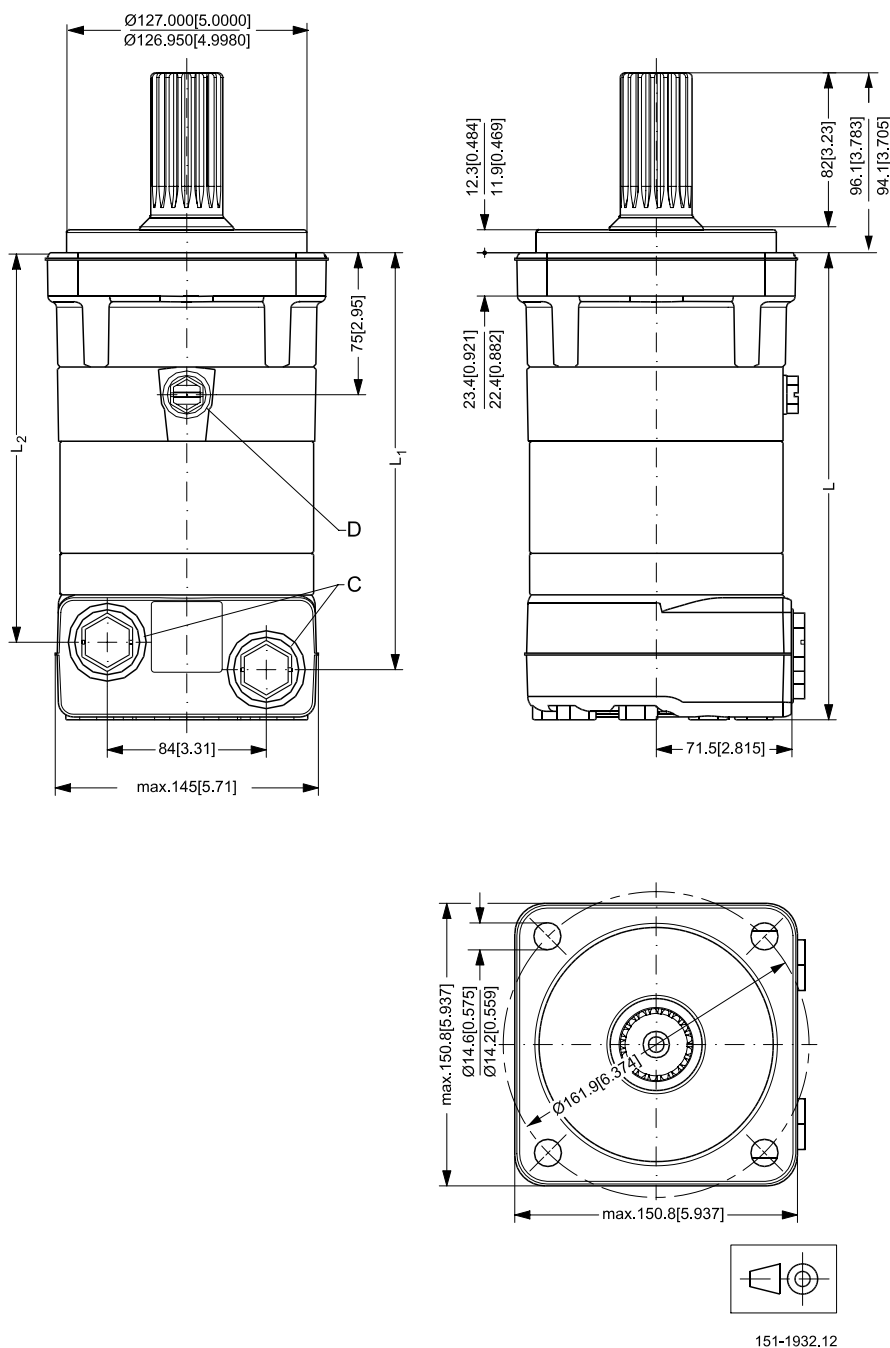


- E:** UNF Release port  
**J:** 7/16 – 20 UNF O-ring boss port

## Dimensions

### US version

4-bolt flange-spigot diameter Ø5 in, SAE C mounting flange - BC Ø6.37 in



**C:** 1 1/16 - 12 UN O-ring boss port; 19 mm [0.75 in] deep

**D:** Drain connection 9/16 - 18 UNF O-ring boss port; 12.7 mm [0.5 in] deep

## Dimensions

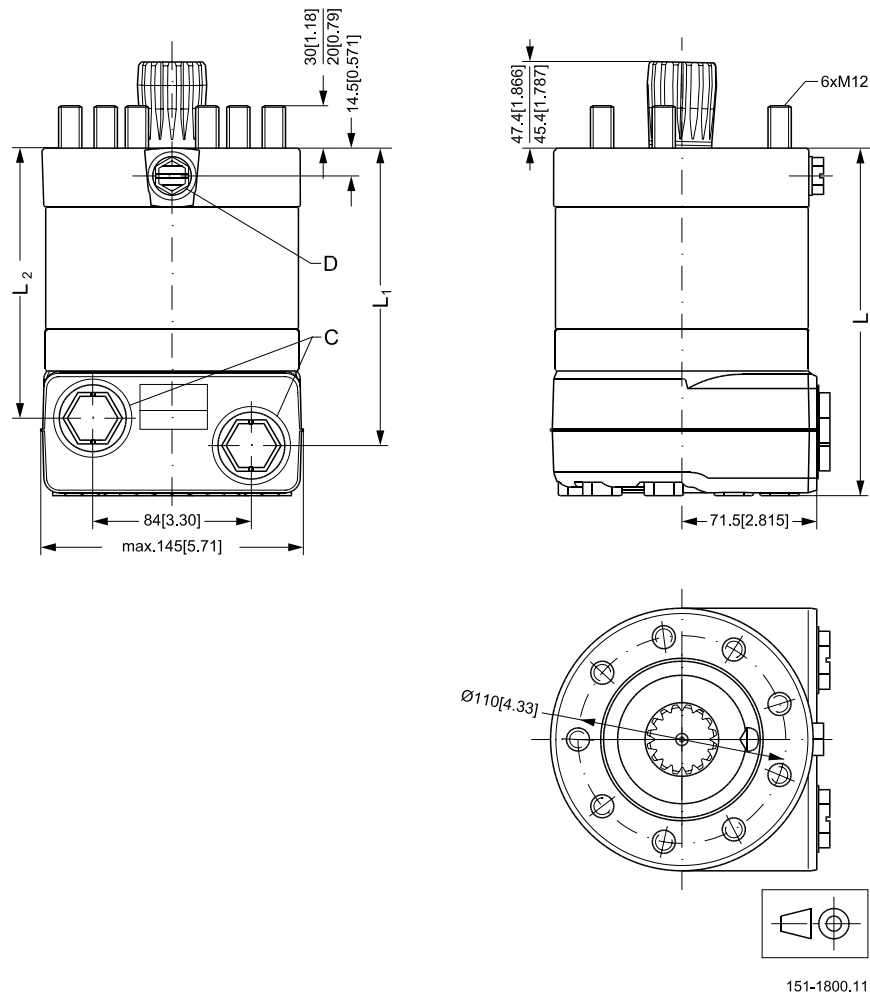
4-bolt flange-spigot diameter Ø5 in, SAE C mounting flange - BC Ø6.37 in

| Type    | L     |        | L <sub>1</sub> |        | L <sub>2</sub> |        |
|---------|-------|--------|----------------|--------|----------------|--------|
|         | mm    | [in]   | mm             | [in]   | mm             | [in]   |
| TMT 250 | 218.7 | [8.61] | 192.4          | [7.57] | 177.9          | [7.00] |
| TMT 315 | 227.9 | [8.97] | 201.7          | [7.94] | 187.2          | [7.37] |
| TMT400  | 238.4 | [9.39] | 212.2          | [8.35] | 197.7          | [7.78] |
| TMT 470 | 246.7 | [9.71] | 220.4          | [8.68] | 205.9          | [8.11] |
| TMT 500 | 238.4 | [9.39] | 212.2          | [8.35] | 197.7          | [7.78] |
| TMT 630 | 252.4 | [9.94] | 226.2          | [8.91] | 211.7          | [8.33] |

## TMTU dimensions

### European version

Bearing less



**C:** G 3/4 ; 17 mm [0.67 in] deep